Name: Rachel Fischhoff Grade: 5 Date: March 20, 2012

In the Drawer

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| Lesson Sources: Groundworks Algebraic Thinking 5 |
| Lesson Objectives: Students will use visual representations (revised or redrawn) to match mathematical relationships given in words and generate equivalent ratios. |
| Standards:   * M(N&O)–5–8 **Applies properties of numbers** (odd, even, and divisibility) and **field properties** (commutative, associative, identity, and distributive) **to solve problems and to simplify computations**. (Local) * M(PRP)–5–1 **Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content** and be able to:Add to the repertoire of problem-solving strategies (e.g., looking for similar problems) and use those strategies in more sophisticated ways. * M(PRP)–5–2 Students will use mathematical reasoning and proof and be able to:Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes. |
| Multicultural Content: |
| Materials and Advanced Preparation: White boards *or* manipulatives... |
| Prior Knowledge and Skills Needed: Some knowledge of ratios, ability to move between concrete, abstract, and representational |
| Key/New Vocabulary: ratio |

Lesson Procedure: Part One

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| **Time** | **Teacher Actions** | **Student Learning Activities** | **Form of Assessment** |
| 1 min | **1. Connection**   * Mathematicians, we’ve talked a lot about the ways mathematicians move between different ways of representing mathematical thinking—visual, numeric, and in words. Today we are going to tackle problems that give us information in words and in pictures. It will be our job to interpret that information to find our answers. | Active listening |  |
| 10 min max | **2. The Teaching (The Giving of Information):**  Let’s take a look at a problem from the packet we’ll be working on today. In this drawer, there are blue socks and there are white socks. I want to take out the fewest number of socks so that there are twice as many white socks as blue socks left in the drawer.  First of all, what do we know about this drawer?  How many white socks are there? (9)  How many blue socks? (7)  How many white socks would I have to remove to have and equal number of white and blue socks? (2)  How many socks would I have to take out so there were more blue than white socks left? (three white)  Other possible answers? (at least three white socks if you leave all the blue socks.)  Hmmm, I know I need to figure out a solution that leaves me with twice as many white socks as blue socks. So there are two times as many white socks as blue socks. Any time I have two times a number, I know the answer is even, so I want to make sure the number of white socks is even. I’m going to remove one white sock so I have 8 left—an even number. | * Active listening * Answering some questions | * Answering q’s |
|  | **3. Have-A-Go (optional)**  Now I have eight white socks and seven blue socks. What color socks—and how many—do I need to remove to have twice as many white socks as blue socks? T&T  Share out/show solutions on whiteboards  Co-create response to “Tell how you figured it out” | How will students be actively involved?  By:   * Partner Talk * Maybe follow along on white boards | * Check white boards * Listen in to T&Ts |
| **Anticipated Responses/Outcomes:**   * One challenge may be understanding the language of the questions—envisioning half of/twice as many * These problems can—and should—be solved with manipulatives or white boards, and that might provide a nice entrypoint for some students | | | |
|  | **4. The Link**  Today you are going to use and change drawings to solve these problems. Just like yesterday, you can use the space below to draw more pictures, and you’ll need to explain your thinking. | **(Workshop Time)**   * What will students go off and do to apply the teaching? * Will students select what strategy or * teaching they want to apply (self determination)? | * How will you know what strategy or teaching students are applying? * What will you record during the conferencing? * Which students will you conference with today? |
|  | **5. Closing (at the share)**  ID different strategies while conferring to highlight during the share | * Choose some students with different approaches (that we can see) | * Conferring * Linking to broader thoughts around representation… |
| **Anticipated Responses/Outcomes:**   * Some students may feel stifled by the visual/concrete representations | | | |

**Reflections:**

How did the lesson plan work? What was effective? What did you learn? What would you change for tomorrow or the next time you will use this plan?